via an evaluation rubric. DISCUSSION/SIGNIFICANCE OF IMPACT: The Emerging Investigators website, developed using the principles of COI provides key learning, reading and resources for early career investigators in a format that is well received by a sample group of early career researchers at Mount Sinai. The website has aimed to address the reported need for communication, collaboration and social interaction with peers and other researchers across the MSHS through the addition of further web-based resources such as a LinkedIn page, a blog to feature research and provide a sounding board for research efforts, and a calendar of events targeted specifically at early career researchers. These were highlighted as areas of particular value by the participants. We anticipate the results of phase 2 rubric-based evaluations will provide actionable data that will lead to further refinement of the website, an optimized interface, and improved usability.

4015

## Evaluation of the Impact of a Clinical and Translational Science Predoctoral Program on Post-Graduate Outcomes

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OBJECTIVES/GOALS: The Mayo Clinic Clinical and Translational Science (CTS) Predoctoral program aims to develop independent researchers capable of leading multi-disciplinary teams to accelerate the translation of discovery to application. Here, we detail the outcomes of our graduates over the past ten years (2010-2019). METHODS/STUDY POPULATION:): A survey was fielded with all CTS graduates whose degrees were conferred since the program's inception to 2019. Items addressed their current position, whether they were still involved in research, what type of research they were involved in, and whether they stayed involved with education. They also submitted a recent CV, from which data were collected about publications and grants. A subset were then contacted for a semi-structured interview. Items included questions addressing motivation for pursuing a PhD in CTS, whether the program prepared them for their current work, gaps they felt they had in training, and whether they felt they were making a difference in the lives of patients. RESULTS/ANTICIPATED RESULTS: Of the 41 alumni, 34 responded (83% response rate). Of these, 19 (56%) are at Mayo Clinic, 9 (26%) work for other academic institutions, and 6 (21%) do not work for an academic institution. Most have remained in research (33/34, 97%). The majority (22/33, 67%) are involved in clinical research, 30% (10/33) in basic science, and 24% (8/33) in healthcare delivery research. Most (23/34, 68%) are engaged in educational activities. When asked about changes they have led, 67% (18/27) led quality improvement projects and 44% (12/27) designed a new research method. Several hold leadership positions either in their organization (12/16, 75%) or in a professional organization (10/16, 63%). DISCUSSION/SIGNIFICANCE OF IMPACT: The CTS Predoctoral program successfully prepares scholars for careers involving clinical and translational research; furthermore, alumni remain in research-oriented careers after graduation. We will continue to gather longitudinal data alumni move forward in their careers.

4350

## From Translational to Transformational: Establishing CLIC's Vision for a Research Education and Training Community

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OBJECTIVES/GOALS: The new CLIC Education & Career Development Gateway aims to be a translational science workforce ecosystem for CTSAs to share learning and training resources and career opportunities. The Gateway also provides individualized assistance to identify and implement TS learning and training resources. METHODS/STUDY POPULATION: The CLIC Education & Career Development Gateway, located on the CLIC website, is an entry way to: 1) the Education Clearinghouse, a platform where CTSA Program hubs can find and share educational resources individually or as part of resource kits; 2) the Opportunities Board, which includes jobs and mini-sabbaticals from CTSA Program hubs; and 3) the Education & Training Navigator, a personalized approach to education and training requests. These approaches help empower and support a cooperative learning and training community that is inclusive and collaborative, facilitating and amplifying opportunities for the sharing of educational resources throughout the translational science workforce. RESULTS/ANTICIPATED RESULTS: Through a person-centered, direct engagement approach, the anticipated outcomes of these efforts are to promote increased collaboration across CTSA Program Hubs and partners, and the amplification of accessible, relevant existing resources. Another anticipated outcome is increased production of educational materials through the reduction of work duplication and identification of gaps in education and training resources. The Gateway also provides an opportunity to communicate the work and efforts that consortium-level special groups (working groups, special interest groups, etc.) produce. Ongoing evaluations and suggestions will help determine future improvements and functionalities. DISCUSSION/SIGNIFICANCE OF IMPACT: CLIC's education and training ecosystem promotes education as a community space to facilitate opportunities for collaboration and partnerships, amplifying visibility of the work created by members of the CTSA community, and encouraging a transformative career trajectory for trainees and scholars.

4143

## HiREC Endowment: Building Models in Research Capacity for Infrastructure Sustainability and Productivity

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OBJECTIVES/GOALS: Improve infrastructure, resources, partnerships, and metrics to enhance the research environment for Hispanic researchers as a Minority Serving Institution. To support the research infrastructure in our Campus to encourage a research culture of sustainability and productivity. METHODS/STUDY POPULATION: Development of four research capacity-building models to enhance the pathway of junior researchers as independent researchers:1. MSc Phase I-Scholar Award 2 years in a Post Doctoral Master in CTR ; 2. Advanced CTR Award 1 year to support research

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infrastructure development in submitting a grant to NIH with the mentoring of a Visiting Endowed Chair; 3. Mini Infrastructure Research Award 1 year provides funds to increase research productivity; 4. Award on Excellence in CTR recognizes a faculty member with a distinguished research portfolio that support HiREC Career Coach and Mentoring approach. HiREC targets junior faculty, early and mid-career researchers from our two partners Schools. RESULTS/ANTICIPATED RESULTS: HiREC has been recognize as support for research infrastructure development. Since 2011, 10 MSc Phase I-Scholar Awards have been granted increasing the pool of trained Hispanics researchers in P. R., the Advanced CTR Award of $50,000 each, from March, 2019, was granted to 2 women researchers from the SoM and 2 Visiting Endowed Chair were accepted as candidates. The Mini Infrastructure Research Award, since 2017, supported the development of 2 Science labs, data analysis, 3 peer review publications and other research capacity building. Two researchers from the SoM were honored with the HiREC 2018 Award on Excellence in CTR heighten the institutional recognition of top researchers' endeavors. DISCUSSION/SIGNIFICANCE OF IMPACT: It's imperative to pursue specific strategies that lead to successful research capacity-building models. By acknowledging institutional research infrastructure needs, trendy scientific and technological knowledges and researchers' needs, HiREC have been able to successfully accomplish its mission. CONFLICT OF INTEREST DESCRIPTION: Authors have no conflict of interest in this research.

**4172**

## Introduction to R Programming and GitHub: Developing Automated Analysis of Complete Blood Count Data as a Translational Science Undergraduate Project

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OBJECTIVES/GOALS: Introduce students to programming and software development practices in the life sciences by analyzing standard clinical diagnostic bloodwork for differential immune responses. Including lectures and a semester project with the goal of enhancing undergraduate students' education to prepare them for careers in translational science. METHODS/STUDY POPULATION: The educational content was taught for the first time as a component of the newly developed course BTEC 330 "Software Applications in the Life Sciences" in UMBC's Translational Life Science Technology (TLST) Bachelor's degree program at the Universities at Shady Grove campus. Eleven students took the course. All were beginners with no programming background. Lectures provided background on the diagnostic components of the CBC, criteria for differential diagnosis in the clinical setting, and introduction to hematology and flow cytometry, forming underpinnings for interpretation of the CBC results. Weekly computer lab practical sessions provided training fundamentals of R programming language, the R-studio integrated development environment (IDE), and the GitHub.com open-source software development platform. RESULTS/ANTICIPATED RESULTS: The graded assignment consisted of a coding project in which students were each assigned an individual parameter from the CBC results. These include, for example, relative lymphocyte count or hemoglobin readouts. Students each created their own R-language script using R-studio, with functional code which: 1) Read in data from a file provided, 2) Performed statistical testing, 3) Read out statistical results as text, and charts as image files, 4) "Diagnosed" individuals in the dataset as being inside or outside the clinical normal range for that parameter. Each student also registered their own GitHub account and published their open-source code. Grading was performed on code functionality by downloading each student repository and running the code with the instructor as an outside developer using the resource. DISCUSSION/SIGNIFICANCE OF IMPACT: In this curriculum, students with no background in programming learned to code a basic R-language script and use GitHub to automate interpretation of CBC results. With advanced automation now becoming commonplace in translational science, such course content can provide introductory level of literacy in development of clinical informatics software.

**4262**

## Latinas and Cervical Cancer: A Nursing-Community Collaborative Project for Improving Health in Vulnerable Populations

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OBJECTIVES/GOALS: We present findings of an academic-community health agency study that explored knowledge of cervical cancer and risks among Latinas. The collaboration between the UCLA School of Nursing and AltaMed, a community-based health organization provided diverse clinical training and opportunities to decrease disparities in marginalized communities. METHODS/STUDY POPULATION: We developed a 19-item open-ended survey guide (English/Spanish) to explore knowledge, beliefs and practices related to cervical cancer. Eight nursing students (females and males) completed a 10-week public health focused practicum at four clinical sites. Students interviewed volunteer Latinas (N = 51) and recorded their responses. Prior to surveying Latina clients, the nursing instructor developed a script and mentored the student through the recruitment process. The survey included items on the Papanicolaou exam (pap smear), the HPV, beliefs and knowledge of risks for cervical cancer and recommendations for health service delivery. RESULTS/ANTICIPATED RESULTS: The Latina participants ranged in age from 20-50s, 70% spoke English, most were US born (52%) and 29% were from Mexico. The majority had received a Pap exam (88%), but fewer understood the purpose for the Pap (72%) or the association between HPV and cervical cancer (6%). Five major themes emerged: (1) knowledge deficits regarding women's preventive care, and the HPV vaccine; (2) limited Spanish language educational materials; (3) importance of respectful client-provider interactions; (4) modesty; and 5) scheduling appointments and the importance of a diverse workforce that understand cultural and language nuances. Recommendations included ways to improve health literacy, cervical cancer knowledge, and delivery of culturally specific health care. DISCUSSION/SIGNIFICANCE OF IMPACT: Finding highlight the importance of putting "personalismo" into practice; linking health behaviors, vaccines, and health care to addresses cervical cancer risks. The collaboration maximized student experiences with opportunities build evidence based sustainable programs for vulnerable communities.

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